

# Living in the Past

## Historical perspective



## RF transmission by alternator

After the turn of the 20th Century, it was known by radio pioneers such as [Reginald Fessenden](#) that a continuous wave (CW), rather than a spark, was needed to transmit voice wirelessly. The problem was that [oscillators](#) of the day could only produce audio-frequency waves, which were not very helpful in getting radio signals go very far. In 1904, Fessenden approached General Electric for help, and Swedish-American engineer employee [Ernst Alexanderson](#) took on the challenge of generating a *radio frequency continuous wave signal*.

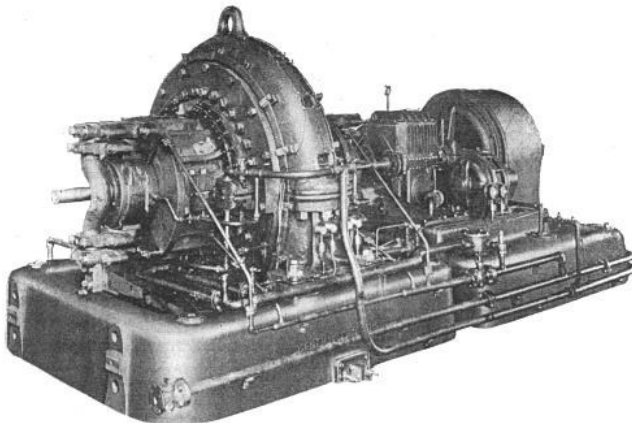
In 1906, Ernst devised a way to generate high-frequency signals by creating a very fast-turning electric generator he termed an [alternator](#), indicating its purpose of producing [alternating current](#). The first one created by him delivered power at 50 kHz, a remarkable breakthrough into the greater-than-20 kHz signal barrier. The next one delivered 75 kHz, which Fessenden used for his transmitter, to make the first AM radio entertainment broadcast on Christmas Eve 1906, and could be heard by Naval ships and shore stations down the US East Coast.

As Ernst continued to develop the alternator, the machine became widely installed as a transmitting station for commercial industry and the military. It was difficult to install one aboard small shipping vessels, due to its large size and weight. By the 1930s, the Alexanderson alternator was replaced by the smaller and much more cost-effective vacuum tube oscillators and transmitters.

Ernst Alexanderson was also a part-pioneer in the development of television. As part of an experiment, he was the first to receive a television signal, from his Schenectady, New York, home in 1927. The following year, Ernst developed the technique of coordinating audio with television images while working for RCA.

In 1923, Ernst's son Verner was kidnapped, and he announced the incident by broadcasting an appeal for help over radio. Three days later, the child was found safe, and the kidnappers were caught. This was possibly the first radio call for help (and possible forerunner of the [AMBER alert](#)?) for a missing or abducted child.

Ernst once developed a [DC \(direct current\) amplifier](#), for which he received a patent. Over his lifetime, Ernst Alexanderson had received 345 US patents, the last filed in 1968 at age 89.



*Alexanderson alternator*